

Atwood Primary Academy

Mathematics Curriculum Guidance



Date: March 2021

Review Date: March 2022

(or to meet new legislation and practices)

Signed By: _____

Position: _____

Date: _____

“The beauty of mathematics only shows itself to more patient followers”

Maryam Mirzakhani

Intent

Mathematics is a deeply interconnected subject that, in order to be truly understood, needs an individual to develop fluency, reasoning and competence in solving increasingly sophisticated problems. At Atwood, **our overarching aim is to provide a high-quality mathematics education so that all children have a deep, long-term, adaptable and secure understanding of the subject, that they can use in their future everyday lives and further education.** It is our belief that if a child has this, they also:

- Have quick recall of basic number facts;
- Use correct mathematical language;
- Seek solutions to problems and appreciate mistakes;
- Have confidence in their own ability;
- Develop persistence through sustained learning over time;
- Seek enjoyment from their own success and
- Help others to be equally successful.

We believe that a mastery approach to the teaching and learning of mathematics is the key to achieving each of these things.

By the end of EYFS

Our aims for the Early Years are that children can work fluently and flexibly with numbers 1-10, and not to be limited to visualising them in solely traditional ways but in real-life situations too. After all, mathematics is a way of perceiving, interacting and being in the world. This develops gradually and is built around the skills of:

- **Counting-** not just rote memorisation but an understanding that each object counted in a set represents ‘one more’.
- **Cardinality-** the last number said when counting a set represents the ‘quantity’ or ‘total number of items’.
- **Comparison-** an understanding of which numbers are ‘more’ or ‘less’ than another.
- **Composition-** having a ‘part, whole’ understanding of number (i.e. a number can be made up of two or more smaller numbers). Our aim is that children, at the end of EYFS, will be able to recall the part, part, whole relationship of numbers up to 5.
- **Pattern-** children recognise and create repeating patterns with increasing complexity as well as growing patterns and relationships between number and shape.
- **Shape, Space and Measure-** use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.

By the end of Key Stage One

By the end of Key Stage One, we aim for our children to have expanded their knowledge of counting, number and place value with numbers 1-100, working fluently and flexibly. This, too, develops gradually and is built around the National Curriculum domains of:

- **Place Value**
- **Addition and Subtraction**
- **Multiplication and Division**
- **Fractions**

- **Measurement**
- **Geometry (Properties of Shape/ Position and Direction)**
- **Statistics (In Year 2)**

By the end of Lower Key Stage Two

Children will move onto more formal calculation methods to secure fluency with whole numbers using the four operations. They secure their understanding of the number system with increasingly bigger numbers. This continues to be a principle focus alongside the National Curriculum domains:

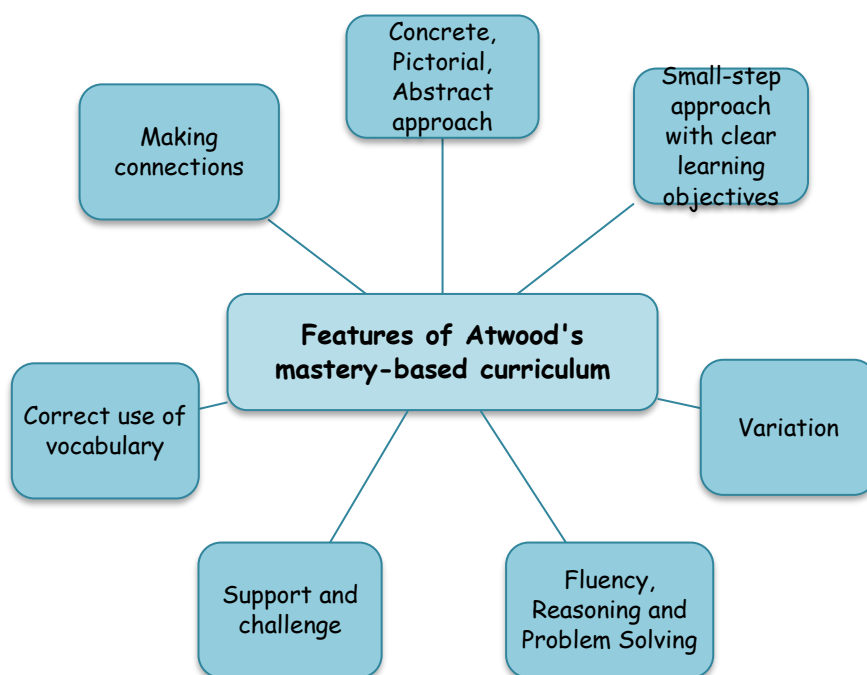
- **Addition and Subtraction**
- **Multiplication and Division**
- **Fractions and Decimals**
- **Measurement**
- **Geometry (Properties of Shape/ Position and Direction)**
- **Statistics**

By the end of Upper Key Stage Two

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This continues to be a principle focus alongside the National Curriculum domains:

- **Addition and Subtraction**
- **Multiplication and Division**
- **Fractions, Decimals and Percentages**
- **Ratio and Proportion**
- **Measurement**
- **Geometry**
- **Statistics**
- **Algebra (In Year 6)**

Implementation



At Atwood, you will see the features of mastery being applied at the precise moments across a series of lessons to ensure time is spent securing understanding at each stage in the learning journey of a child. Each lesson has a clear learning objective, which is a 'small step' where all children will eventually secure deeper mathematical understanding. Lessons will unfold a concept gradually, using the concrete, pictorial, abstract (CPA) approach to highlight the structures being taught, to enhance mathematical understanding and support children to build mental images and eventual fluency. This journey of learning is shared explicitly with the children at the beginning of lessons either on working walls or on lesson slides.

Every lesson is taught as a whole class, with the belief that all children can achieve at maths. Differentiation is provided through support and challenge to ensure the needs of all learners is met. Support can take the form of: scaffolded materials; careful questioning; more time spent working with concrete materials; small-group focus groups either in lesson or in assembly time with the class teacher and/or teaching assistant. You will find an adult working with specific individuals or groups of children, if the class teacher has deemed this support is necessary and will support to boost the depth of learning achieved by these targeted individuals. For children who master the material more quickly, extension (named 'Unlock') challenges are given which require deeper thinking through the method of careful variation and/ or questioning.

We use a combination of schemes to inform our planning. We use the 'White Rose' to support the development of small steps, as well as to ensure clear coverage and progression across years and key stages. In the current academic year (2020/21), staff will also be using the DfE Mathematics Guidance in all year groups to identify the most important knowledge and understanding within each year group before referring to the White Rose. We also use 'Deepening Understanding' and *Maths No Problem* as supplementary sources for rich thinking tasks and/or to look for representations, to help expose the mathematical concepts being taught. Although each of the mathematical domains are taught separately, class teachers seek out and act on any opportunity where connections between these domains can be made. For example, 'Addition and Subtraction' can be taught or revised and revisited through the context of 'Measurement: money, mass, volume and temperature'.

Subject knowledge is key to successful teaching for mastery and so our teachers are beginning to use the NCETM Professional Development resources, to build their subject and pedagogical knowledge to improve mathematics teaching, in combination with the White Rose resources. Teachers are provided with opportunities to co-plan as a year group and with the subject lead (a NCETM Accredited Mastery Specialist) to ensure all aspects of mastery are implemented appropriately and are continually supported in using new resources confidently.

Mathematics for mastery: Early Years

Children are given ample opportunity to enjoy, explore, practise and talk confidently about mathematics through positive, engaging and dynamic learning environments. These are either adult or child initiated both within the indoor and outdoor provision. Mathematical learning opportunities with the childrens' real life experiences (such as songs, rhymes, stories and routines) are also made, so that 'bi-numeracy' can be developed (a connection between the abstract, formal aspects of mathematics and the childrens' own mathematical experiences).

Mathematics for mastery: Special Educational Needs

The principles of mastery is that the 'vast majority of pupils will move through the programmes of study at broadly the same pace. However, decisions when to progress should always be based on the security of the pupils' understanding and their readiness to progress to the next stage' (NCETM, Charlie Stripp). Therefore if a child is having more difficulty grasping a mathematical concept, they will be given the necessary support in order to master it.

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors such as classroom organisation, teaching materials,

teaching style, and differentiation so that we can take some additional or different action to enable the child to learn more effectively.

Impact

As a direct result of teaching for mastery, children are:

- Happier, more enthusiastic learners in mathematics. They accept the 'challenge of mathematics';
- Increasingly willing to explain their mathematical strategies;
- More able to quickly recall number facts, including multiplication and division facts;
- Able to represent their answers and ideas in different ways and
- Are beginning to correctly use mathematical vocabulary;

In addition to the above, a greater proportion of children are on track with mathematics, as well as the proportion of children working at greater depth. We acknowledge that fully implementing teaching for mastery is a long-term and ambitious goal. For the moment, existing attainment gaps in older years is wider than in younger years so embedding a teaching for mastery approach is more challenging in these year groups.

The assessment methods we adopt at Atwood are to positively influence the success of our most vulnerable learners (i.e. any child who is in danger of not securing the learning), and are not limited to children who are notoriously lower attainers. In-lesson intervention is often given to any learner **when necessary**, not automatically. Opportunities for this 'assessment of learning' are interwoven with in the mathematics teaching sequence through the use of mini plenaries, questioning, children's responses and discussions with children. Teachers in each year group moderate a sample of mathematics books, from a variety of children, at the end of each half term to ensure that their teacher assessment is standardised. This is also extended to more formal methods of assessment. Progress is tracked termly, alongside other subjects, through formal data submission and pupil progress meetings. Although not compulsory in non-SATs year groups, summative assessment may also take place to help inform teacher assessment.